

Docket No. 0512-1268  
Appln. No. 10/528,762

REMARKS

In the final Office Action of September 15, 2009 the Office noted that claims 74-94 were pending and rejected claims 74-94. In this amendment, claims 74, 77, 81, 86 and 89 have been amended, no claims have been canceled, and, thus, in view of the foregoing claims 74-94 remain pending for reconsideration which is requested. No new matter has been added. The Office's rejections and objections are traversed below.

CLAIM OBJECTION

Claims 77, 89 and 91 stand objected to for informalities. In particular, the Office asserts that the claims contain irregular characters or are improperly dependent. The Applicants have amended the claims to overcome the objections.

Withdrawal of the objections is respectfully requested.

REJECTIONS under 35 U.S.C. § 101

Claims 74-94 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. In particular, the Office asserts that the claims fail to comply with the requirements of *In re Bilski*, or that the claims could be performed without a machine.

The Applicants have amended the claims to overcome the rejections. Support for the amendment may be found, for example in ¶ 00239 of the printed publication version

of the Specification.

Withdrawal of the rejections is respectfully requested.

REJECTIONS under 35 U.S.C. § 112

Claims 38, 39, 43-45, 51, 63, 64, 66, 68 and 71 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement.

In particular, the Office asserts that the Specification fails to disclose "method for determining filtering combinations of a spatial processing operation, the filtering combinations ( $C_{l,m}^{(i)}$ ) being applied to an initial sound field representation ( $P_{l,m}^{(i)}$ ) formed by coefficients representative of the initial sound field in time and in the three spatial dimensions, in order to provide a modified sound field representation ( $P_{l,m}^{(r)}$ ) formed by coefficients representative of that field in time and in the three spatial dimensions," (emphasis added) as in claim 74.

However, ¶ 0089 of the printed publication version of the Specification states:

*Step 10 permits the production of a modified representation corresponding to a representation in time and in the three spatial dimensions of the initial sound field modified by the defined processing, in the form of a set of coefficients referred to as Fourier-Bessel coefficients. [Emphasis added]*

Further ¶ 0169 of the printed publication version of the Specification states:

The filtering combinations so defined are applied during *step 10* of applying the filtering combinations, which transforms the initial representation  $P_{lm}^{(i)}(f)$  into a modified representation which is indicated  $P_{lm}^{(n)}(f)$  and which corresponds to a modified sound field, by applying thereto the processing filters representative of the at least spatial processing defined in step 2.  
[Emphasis added]

Thus, the two paragraphs taken together describe "an initial sound field representation ( $P_{lm}^{(i)}$ ) formed by coefficients representative of the initial sound field in time and in the three spatial dimensions," as in claim 74.

Further, ¶ 0096 of the printed publication version of the Specification states

Additionally or alternatively, step 4 comprises a sub-step 14 for the input of a processing instruction which is interpreted automatically in an interpretation sub-step 16 permitting the automatic provision of all or part of the set of directivity functions in one or other of a plurality of predetermined formats. For example, the processing is used by software means in a computer and the processing instruction is in the form of an icon whose validation brings about the performance of a given processing operation by the software means.

Thus, the Specification describes "means for defining the processing operation by one directivity function and a predetermined operation applied on: the initial sound field represented as a directivity function, and the directivity function of the processing operation, means for determining weighting coefficients associated with the predetermined operation, wherein determining (6) filtering combinations comprises determining (30) each filtering combination from a

linear combination of the spherical harmonic coefficients (G) with the weighting coefficients (c)," as in claim 86.

Claims 86-94 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In particular, the Office asserts the claim 86 mixed claim types. The Applicants have amended the claim to overcome the rejection. The Applicants submit that no new matter is believed to have been added by the amendment of claim 86.

Withdrawal of the rejections is respectfully requested.

REJECTIONS under 35 U.S.C. § 102

Claims 74, 77, 78, 80, 82, 84, 86, 89, 90, 92, and 94 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Moorer, U.S. Patent No. 6,904,152. The Applicants respectfully disagree and traverse the rejection with an argument.

Moorer discusses a listener surrounded by loudspeakers (col. 4, lines 30-50), monaural recording of sound sources (col. 4, lines 51-65), general explanation about spatial harmonics (col. 5, lines 1-40), mixing of monaural sound sources into loudspeaker signals to give an apparent direction to the listener (col. 5, line 41 through col. 6, line 34), determination of the mixing gains providing the desired source direction (col. 6 line 35 through col. 7, line 50), direct reproduction by connecting

loudspeaker signals to loudspeakers (col. 7, lines 51-62), the case of misplaced loudspeakers (col. 7. line 64 to col. 8, line 12), and rematrixing of the misplaced loudspeaker signals to accommodate the real loudspeaker placement and provide correct apparent direction of sound sources (col. 8, lines 13 to 46).

Thus, Moorer uses matrixes in order to place monaural sources into loudspeaker signals or in order to reproduce the position of the sources taking into account the loudspeaker positions.

Moorer introduces spherical harmonics later in the specification as an obvious generalization to the 3D case of the method described for the 2D case. The Applicants respectfully submit that such a description is insufficient to enable one of ordinary skill in the art to reproduce the spherical harmonics of the instant claims.

The spherical harmonic coefficients are used to compute the gains of some matrixes. However, in Moorer, these coefficients are never explicitly or inherently established.

Further, in Moorer, the directivity function ("directionality", col. 16, line 29 to col. 18, line 63) represents the features of the microphones used to record the sound sources. Thus, in Moorer, the directivity functions do not define processing.

Moreover, Moorer does not disclose determining the spherical harmonic coefficients of the directivity functions and

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using tile determined coefficients to establish processing matrixes.

Further, concerning the claim rejection in point 14 of the Office Action, the Applicants respectfully notice that the present invention concerns a method for modifying/transforming a sound field representation and does not concern a method for determining a representation from microphones and for determining loudspeaker signals to reproduce the represented sound field. Thus, Moorer should not be considered as relevant prior art for the present application

For at least the reasons discussed above, Moorer fails to disclose "defining (2) via a programmed computer processor the processing operation by a set of at least one directivity function, establishing (4) via a programmed computer processor spherical harmonic coefficients of each directivity function, determining (6) via a programmed computer processor the filtering combinations from the spherical harmonic coefficients," as in claim 74.

On page 7 of the Office Action, it is asserted that Figs. 1, 2, 9 and 10 disclose "an initial sound field representation ( $P_{l,m}^{(I)}$ ) formed by coefficients representative of the initial sound field in time and in the three spatial dimensions, in order to provide a modified sound field representation ( $P_{l,m}^{(T)}$ ) formed by coefficients representative of that field in time and in the three spatial dimensions," as in claim 74.

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However, Moorer, Fig. 1, merely illustrates the placement of loudspeakers and as such does not disclose the instant feature of the claims. Fig. 3 concerns the matrix of gains (21-25, 31-35) for placing monaural sounds ('7, 18) into loudspeaker signals (51-55). Moorer, col. 5, line 58 states "figure 3 is a technique of 'positioning' the monaural sounds." Moorer, col. 5, lines 44-47 states "...five signals 51, 52, 53, 54 and 55 are ... to drive an individual loudspeaker." Moorer, Figs. 9 and 10 concern the arrangement of spherical coordinates, and consequently, these passages do not disclose:

- an initial sound field representation;
- a modified sound field representation;
- established directivity functions; and
- established spherical harmonic coefficients of the directivity functions.

For at least the reasons discussed above, claims 74 and 86 and the claims dependent therefrom are not anticipated by Moorer.

Withdrawal of the rejection is respectfully requested.

REJECTIONS under 35 U.S.C. § 103

Claims 75, 76, 87 and 88 stand rejected under 35 U.S.C. § 103(a) as being obvious over Moorer in view of Elko, U.S. Patent No. 2003/0147539. The Applicants respectfully disagree and traverse the rejection with an argument.

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Elko adds nothing to the deficiencies of Moorer as applied against the independent claim. Therefore, for at least the reasons discussed above, Moorer and Elko, taken separately or in combination, fail to render obvious claims 74-94.

Withdrawal of the rejection is respectfully requested.

SUMMARY

It is submitted that the claims satisfy the requirements of 35 U.S.C. §§ 101, 112, 102 and 103. It is also submitted that claims 74-94 continue to be allowable. It is further submitted that the claims are not taught, disclosed or suggested by the prior art. The claims are therefore in a condition suitable for allowance. An early Notice of Allowance is requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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